

**What is claimed is:**

1. A microelectrode comprising:
  - a substrate having a trench;
  - a support film formed on said substrate so that a cavity is formed in said trench;
  - a sealing film formed on said support film to seal said cavity;
  - a microheater formed on said sealing film, with said microheater being composed of resistor which can diffuse heat;
  - an insulation film formed on the entire structure including said microheater;
  - a plurality of wirings formed on portions of said insulation film and connected to said microheater through contact holes;
  - an electrode formed on a portion of said insulation film and indirectly heated by said microheater; and
  - a protection film formed on the entire structure including said electrode and wirings, and patterned to expose a portion of said electrode and wirings.
2. The microelectrode of claim 1, wherein said microheater consists of any one of platinum and doped polysilicon.
3. The microelectrode of claim 1, wherein the inside of said cavity is maintained to be vacuum.

4. The microelectrode of claim 1, wherein said electrode is formed of any one of platinum and material including platinum.

5. The microelectrode of claim 1, wherein said electrode is formed as IDA structure.

6. The microelectrode of claim 1, further comprising a metal electrode formed on said electrode.

7. The microelectrode of claim 6, wherein said metal electrode is formed as IDA structure.

8. The microelectrode of claim 6, wherein area of said metal electrode is larger than that of said cavity.

9. The microelectrode of claim 1, wherein the number of electrode that said each microelectrode has is one or more.

10. The microelectrode of claim 9, wherein on top of said plurality of electrodes is formed one metal electrode.

11. The microelectrode of claim 1, wherein said protection film is patterned so that said electrode is less exposed than the area of said cavity.

12. The microelectrode of claim 1, wherein said wiring is formed of one of aluminum and material including aluminum.

13. A microelectrode array, wherein the microelectrode as claimed in any one of claims 1 to 12 is arranged in the shape of array, said microelectrode array is constructed so that said wirings connected to each microheater are respectively connected to wiring and pad of microheater or independently connected to each pad.

14. A method of manufacturing a microelectrode, comprising the steps of:

- forming a thermal oxide prevention film on a silicon substrate;
- forming a trench array composed of a plurality of trenches by patterning said thermal oxide protection film and thereafter etching silicon substrate of exposed portion;
- proceeding a thermal oxidation process so that a first sacrificial layer is formed in said trench;
- forming a second sacrificial layer on said silicon substrate including said first sacrificial layer after removing said thermal oxidation prevention film;
- forming an etching hole so that both sides of said second sacrificial layer are exposed by forming a support film on entire upper surface and then patterning it;
- forming a cavity on said silicon substrate by removing said first and second sacrificial layers through said etching hole;
- forming a sealing film on said support film so as to seal said cavity;

forming a microheater composed of resistor which can diffuse heat on said sealing film on top of said cavity;

forming a contact hole so as to expose predetermined portion of said microheater by forming an insulation film in entire upper surface and thereafter patterning it;

forming a plurality of wirings connected to said microheater through said contact hole on said insulation film;

forming an electrode on said insulation film on top of said microheater;  
and

exposing predetermined portion of said wirings and electrode by forming a protection film in entire upper surface and thereafter patterning it.

15. The method of manufacturing a microelectrode of claim 14, wherein said wiring and electrode are formed at the same time.

16. The method of manufacturing a microelectrode of claim 14, wherein the ratio of size of line : width of said trench array is 0.45 : >0.55.

17. The method of manufacturing a microelectrode of claim 14, wherein at said thermal oxidation process, a micro porosity is formed in said each trench.

18. The method of manufacturing a microelectrode of claim 14, further comprising the step of forming a metal electrode in top of said electrode.